

JF

PCT09

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/763,331

DATE: 07/11/2001
TIME: 11:25:16

Input Set : A:\PTO.txt
Output Set: N:\CRF3\07112001\I763331.raw

ENTERED

4 <110> APPLICANT: Martin, Charles E.
5 Mitchell, Andrew
8 <120> TITLE OF INVENTION: Synthetic Fatty Acid Desaturase Gene for
9 Expression in Plants
12 <130> FILE REFERENCE: 97-0081 PCT
C--> 14 <140> CURRENT APPLICATION NUMBER: US/09/763,331
C--> 14 <141> CURRENT FILING DATE: 1999-08-24
14 <150> PRIOR APPLICATION NUMBER: US 60/097,586
15 <151> PRIOR FILING DATE: 1998-08-24
17 <160> NUMBER OF SEQ ID NOS: 8
19 <170> SOFTWARE: FastSEQ for Windows Version 4.0
21 <210> SEQ ID NO: 1
22 <211> LENGTH: 1555
23 <212> TYPE: DNA
24 <213> ORGANISM: *Saccharomyces cerevisiae*
26 <400> SEQUENCE: 1
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28 gatatgactct gcccaggatg gatattgtcga cgaagtcgac ttaacggaa ctaatatttt 120
29 ggctactgggt ttgaataaga aagcaccaag aattgtcaac gttttgggtt cttaatggg 180
30 ctccaaaggaa atggtttccg tggatttcga caagaaggaa aacgaaaaga agtccaattt 240
31 gatatgtctg ctatggaaagg acaaccaaga aaaagaagaa gctaaaacta aaattcacat 300
32 ctccgaacaa ccatggactt tgaataactg gcaccaacat ttgaacttgt tgaacatgg 360
33 tcttgggtgt ggtatgccaa tgattgggtt gtacttcgct ctctctggta aagtacctt 420
34 gcatttaaac gttttccctt tctccgtttt ctactacgct gtcgggtgtt tttcttattac 480
35 tgccgggttac catagattat ggtctcacag atcttactcc gtcactggc cattgagatt 540
36 attctacgct atcttcgggtt gtgcttcgtt tgaagggtcc gctaaatggt gggggccactc 600
37 tcacagaatt caccatcggtt acactgatac ttgagagat ccttatgacg ctcgttagagg 660
38 tctatggtagc tcccacatgg gatggatgtc ttgaagcca aatccaaaat acaaggctag 720
39 agtctatggatc accgatatacgtt ctgatgattt gaccatttga ttccaaacaca gacactacat 780
40 cttgtttagt ttatggatc ctttcgtcat tccaaactttt atctgtgggtt acttttca 840
41 cgactatatg ggtgggttga tctatgcccgg ttttattcgt gtctttgtca ttcaacaagc 900
42 tacctttgc attaactcca tggctcatta catcggttacc caaccattcg atgacagaag 960
43 aaccctcgat gacaactgga ttactgcccattt gtttactttt ggtgaagggtt accataactt 1020
44 ccaccacgaa ttcccaactg attacagaaa cgcttattaaag tggtagccaaat acgaccac 1080
45 taagggttac atcttattgtc cttctttatgt tggtagccaaat tggtagccaaat acgaccac 1140
46 tcaaaatgtt attgaagaag ctttgattca acaagaacaa aagaagatca ataaaaagaa 1200
47 ggctaaaggatt aactgggttc cagtttgcac tgatttgcac atgtgggaca aacaaaccc 1260
48 cttggctaaatg tctaaggaaa acaagggtttt ggttattcatt tctgggtattt ttcacgacgt 1320
49 atctgggtat atctctgaac atccaggtgg tggatgttattt attaaaactg cattaggttt 1380
50 ggacgcttacc aaggcttca gtgggtgtt ctaccgttacc tcaaatggc ctcaaatgt 1440
51 cttggctgat atgagagttt cttttatcaa ggaaatgtt aactctgttca ttggatggc 1500
52 tagtaagaga ggtgaaatct acgaaactgg taagttttt taagcatcac attac 1555
54 <210> SEQ ID NO: 2
55 <211> LENGTH: 510
56 <212> TYPE: PRT
57 <213> ORGANISM: *Saccharomyces cerevisiae*
59 <400> SEQUENCE: 2

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60 Met Pro Thr Ser Gly Thr Thr Ile Glu Leu Ile Asp Asp Gln Phe Pro
61 1 5 10 15
62 Lys Asp Asp Ser Ala Ser Ser Gly Ile Val Asp Glu Val Asp Leu Thr
63 20 25 30
64 Glu Ala Asn Ile Leu Ala Thr Gly Leu Asn Lys Lys Ala Pro Arg Ile
65 35 40 45
66 Val Asn Gly Phe Gly Ser Leu Met Gly Ser Lys Glu Met Val Ser Val
67 50 55 60
68 Glu Phe Asp Lys Lys Gly Asn Glu Lys Lys Ser Asn Leu Asp Arg Leu
69 65 70 75 80
70 Leu Glu Lys Asp Asn Gln Glu Lys Glu Ala Lys Thr Lys Ile His
71 85 90 95
72 Ile Ser Glu Gln Pro Trp Thr Leu Asn Asn Trp His Gln His Leu Asn
73 100 105 110
74 Trp Leu Asn Met Val Leu Val Cys Gly Met Pro Met Ile Gly Trp Tyr
75 115 120 125
76 Phe Ala Leu Ser Gly Lys Val Pro Leu His Leu Asn Val Phe Leu Phe
77 130 135 140
78 Ser Val Phe Tyr Tyr Ala Val Gly Gly Val Ser Ile Thr Ala Gly Tyr
79 145 150 155 160
80 His Arg Leu Trp Ser His Arg Ser Tyr Ser Ala His Trp Pro Leu Arg
81 165 170 175
82 Leu Phe Tyr Ala Ile Phe Gly Cys Ala Ser Val Glu Gly Ser Ala Lys
83 180 185 190
84 Trp Trp Gly His Ser His Arg Ile His His Arg Tyr Thr Asp Thr Leu
85 195 200 205
86 Arg Asp Pro Tyr Asp Ala Arg Arg Gly Leu Trp Tyr Ser His Met Gly
87 210 215 220
88 Trp Met Leu Leu Lys Pro Asn Pro Lys Tyr Lys Ala Arg Ala Asp Ile
89 225 230 235 240
90 Thr Asp Met Thr Asp Asp Trp Thr Ile Arg Phe Gln His Arg His Tyr
91 245 250 255
92 Ile Leu Leu Met Leu Leu Thr Ala Phe Val Ile Pro Thr Leu Ile Cys
93 260 265 270
94 Gly Tyr Phe Phe Asn Asp Tyr Met Gly Gly Leu Ile Tyr Ala Gly Phe
95 275 280 285
96 Ile Arg Val Phe Val Ile Gln Gln Ala Thr Phe Cys Ile Asn Ser Leu
97 290 295 300
98 Ala His Tyr Ile Gly Thr Gln Pro Phe Asp Asp Arg Arg Thr Pro Arg
99 305 310 315 320
100 Asp Asn Trp Ile Thr Ala Ile Val Thr Phe Gly Glu Gly Tyr His Asn
101 325 330 335
102 Phe His His Glu Phe Pro Thr Asp Tyr Arg Asn Ala Ile Lys Trp Tyr
103 340 345 350
104 Gln Tyr Asp Pro Thr Lys Val Ile Ile Tyr Leu Thr Ser Leu Val Gly
105 355 360 365
106 Leu Ala Tyr Asp Leu Lys Lys Phe Ser Gln Asn Ala Ile Glu Glu Ala
107 370 375 380
108 Leu Ile Gln Gln Glu Gln Lys Lys Ile Asn Lys Lys Ala Lys Ile

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109	385	390	395	400												
110	Asn	Trp	Gly	Pro	Val	Leu	Thr	Asp	Leu	Pro	Met	Trp	Asp	Lys	Gln	Thr
111							405				410					415
112	Phe	Leu	Ala	Lys	Ser	Lys	Glu	Asn	Lys	Gly	Leu	Val	Ile	Ile	Ser	Gly
113								420			425					430
114	Ile	Val	His	Asp	Val	Ser	Gly	Tyr	Ile	Ser	Glu	His	Pro	Gly	Gly	Glu
115								435			440					445
116	Thr	Leu	Ile	Lys	Thr	Ala	Leu	Gly	Lys	Asp	Ala	Thr	Lys	Ala	Phe	Ser
117								450			455					460
118	Gly	Gly	Val	Tyr	Arg	His	Ser	Asn	Ala	Ala	Gln	Asn	Val	Leu	Ala	Asp
119	465							470			475					480
120	Met	Arg	Val	Ala	Val	Ile	Lys	Glu	Ser	Lys	Asn	Ser	Ala	Ile	Arg	Met
121								485			490					495
122	Ala	Ser	Lys	Arg	Gly	Glu	Ile	Tyr	Glu	Thr	Gly	Lys	Phe	Phe		
123								500			505					510
126	<210> SEQ ID NO: 3															
127	<211> LENGTH: 1555															
128	<212> TYPE: DNA															
129	<213> ORGANISM: Artificial Sequence															
131	<220> FEATURE:															
132	<223> OTHER INFORMATION: synthetic yeast delta-9 desaturase gene modified															
133	for expression in plants															
135	<400> SEQUENCE: 3															
136	ggatccaaca	atgcctactt	ctggaaactac	tatcgagctt	atcgatgatc	aattccctaa										60
137	ggatgattct	gcttttctg	gaatcggtta	tgagggttcat	cttactgagg	ctaacatcct										120
138	tgctactgg	cttaacaaga	aggctcctag	aatcgtaac	ggattcggat	ctcttatggg										180
139	atctaaggag	atgggttctg	ttgagttcga	taagaaggga	aacgagaaga	agtcataac										240
140	tgatagactt	cttgagaagg	ataaccaaga	gaaggaggag	gctaagacta	agatccatat										300
141	ctctgagcaa	ccttggactc	tcaacaactg	gcatcaacat	ctcaactggc	tcaacatgg										360
142	gctcgctgt	ggaatgccta	tgatcgatg	gtacttcgct	ctctctgaa	aagtgcctct										420
143	ccatctcaac	gttttcctct	tctctgtctt	ctactacgt	gttggaggag	tgtctatcac										480
144	tgctggatac	catagactct	ggtctcatag	atcttactct	gctcattggc	ctcttagact										540
145	cttctacgct	atctttggat	gtgcttctgt	tgagggatct	gctaagtgg	ggggacattc										600
146	tcatagaatc	catcatagat	acactgatac	tcttagagat	ccttacgatg	ctagaagagg										660
147	actttggatc	tctcatatgg	gatggatgt	tcttaagcct	aaccctaagt	acaaggctag										720
148	agctgatatc	actgatatga	ctgatgattg	gactatcaga	ttccaacata	gacattacat										780
149	cttgctcatg	ctccttactg	ctttcgtat	ccctactctc	atctgtggat	acttcttcaa										840
150	cgattacatg	ggaggactca	tctacgctgg	attcatcaga	gtgttcgtca	tccaaacaagc										900
151	tactttctgt	atcaactcta	tggctcatta	catcgaaact	caaccttgc	atgatagaag										960
152	aactcctaga	gataactgga	tcactgctat	cgttacttgc	ggagagggat	accataactt										1020
153	ccatcatgag	ttcccttactg	attatagaaa	cgctatcaag	tggtaaccat	acgatcctac										1080
154	taaaagtgtac	atctacttga	cttctctcg	gggacttgc	tacgatctca	agaagttctc										1140
155	tcaaaaacgct	atcgaggagg	ctcttatacca	acaagagcaa	aagaagatca	acaagaagaa										1200
156	ggctaagatt	aattggggac	ctgttcttac	tgatcttgc	atgtggata	agcaaacttt										1260
157	ccttgcttaag	tctaaggaga	acaagggtact	tgttatcatc	tctggaatcg	ttcatgtatgt										1320
158	ttctggatac	atctctgagc	atcctggagg	agagacttta	attaagactg	ctcttggaaa										1380
159	ggatgctact	aaggcttct	ctggaggagt	ttacagacat	tctaaccgt	ctcaaaaacgt										1440
160	gcttgctgat	atgagagttg	ctgttatcaa	ggagtctaa	aactctgcta	tcaaatggc										1500
161	ttctaagaga	ggagagatct	acgagactgg	aaagttcttc	tgtatctagag	gatcc										1555

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163 <210> SEQ ID NO: 4
164 <211> LENGTH: 383
165 <212> TYPE: PRT
166 <213> ORGANISM: Arabidopsis thaliana
168 <400> SEQUENCE: 4
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171 Glu Thr Asp Thr Thr Lys Arg Val Pro Cys Glu Lys Pro Pro Phe Ser
172 20 25 30
173 Val Gly Asp Leu Lys Lys Ala Ile Pro Pro His Cys Phe Lys Arg Ser
174 35 40 45
175 Ile Pro Arg Ser Phe Ser Tyr Leu Ile Ser Asp Ile Ile Ile Ala Ser
176 50 55 60
177 Cys Phe Tyr Tyr Val Ala Thr Asn Tyr Phe Ser Leu Leu Pro Gln Pro
178 65 70 75 80
179 Leu Ser Tyr Leu Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val
180 85 90 95
181 Leu Thr Gly Ile Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
182 100 105 110
183 Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Phe His Ser
184 115 120 125
185 Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
186 130 135 140
187 His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
188 145 150 155 160
189 Gln Lys Ser Ala Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu
190 165 170 175
191 Gly Arg Ile Met Met Leu Thr Val Gln Phe Val Leu Gly Trp Pro Leu
192 180 185 190
193 Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp Gly Phe Ala Cys
194 195 200 205
195 His Phe Phe Pro Asn Ala Pro Ile Tyr Asn Asp Arg Glu Arg Leu Gln
196 210 215 220
197 Ile Tyr Leu Ser Asp Ala Gly Ile Leu Ala Val Cys Phe Gly Leu Tyr
198 225 230 235 240
199 Arg Tyr Ala Ala Ala Gln Gly Met Ala Ser Met Ile Cys Leu Tyr Gly
200 245 250 255
201 Val Pro Leu Leu Ile Val Asn Ala Phe Leu Val Leu Ile Thr Tyr Leu
202 260 265 270
203 Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp Asp
204 275 280 285
205 Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile Leu
206 290 295 300
207 Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Leu
208 305 310 315 320
209 Phe Ser Thr Met Pro His Tyr Asn Ala Met Glu Ala Thr Lys Ala Ile
210 325 330 335
211 Lys Pro Ile Leu Gly Asp Tyr Tyr Gln Phe Asp Gly Thr Pro Trp Tyr
212 340 345 350

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213 Val Ala Met Tyr Arg Glu Ala Lys Glu Cys Ile Tyr Val Glu Pro Asp

214 355 360 365

215 Arg Glu Gly Asp Lys Lys Gly Val Tyr Trp Tyr Asn Asn Lys Leu

216 370 375 380

219 <210> SEQ ID NO: 5

220 <211> LENGTH: 1372

221 <212> TYPE: DNA

222 <213> ORGANISM: Arabidopsis thaliana

224 <400> SEQUENCE: 5

225 agagagagag attctgcgga ggagcttctt cttcgttaggg tgttcatcggt tattaacgtt 60

226 atcgccccta cgtcagctcc atctccagaa acatgggtgc aggtgaaaga atgccggttc 120

227 ctacttcttc caagaaaatcg gaaaccgaca ccacaaaagcg tggccgtgc gagaaccgc 180

228 ctttctcggt gggagatctg aagaaagcaa tcccgccgca ttgtttcaaa cgctcaatcc 240

229 ctcgctctt ctcctacctt atcagtgaca tcattatagc ctcatgcttc tactacgtcg 300

230 ccaccaatta cttctctctc ctcctcagc ctctctctt ctggcttgg ccactctatt 360

231 gggcctgtca aggctgtgtc ctaactggta tctgggtcat agcccacgaa tgcggtcacc 420

232 acgcattcag cgactaccaa tggctggatg acacagttgg tcttatcttc catcccttcc 480

233 tcctcgtccc ttacttctcc tggaaagtata gtcatcgccg tcaccatcc aacactggat 540

234 ccctcgaaag agatgaagta ttgtcccaa agcagaaatc agcaatcaag tggtaacggga 600

235 aataccctcaa caacccttgg acgcgtatca tgatgttaac cgtccagttt gtccctgggt 660

236 ggccttgc ttcgcctt aacgtctctg gcagaccgtt tgacgggttc gcttgcatt 720

237 tcttccccaa cgctccatc tacaatgacc gagaacgcct ccagatatac ctctctgtatg 780

238 cgggtattct agccgtctgt ttgttctt accgttacgc tgctgcacaa gggatggcct 840

239 cgatgatctg ctcctacgga gtaccgcctt tgatagtgaa tgcgttgc tgcgttgc 900

240 ttacttgca gcacactcat ccctcggtc ctcactacga ttcatcagag tggactggc 960

241 tcaggggagc ttgttgcacc gtagacagag actacggat ttgaacaag gtgttccaca 1020

242 acattacaga cacacacgtg gtcatcacc tggttcgac aatgccgtt tataacgc 1080

243 tggaaagctac aaaggcgata aagccaattc tggagacta ttaccgttgc gatggacac 1140

244 cgtggatgt agcgatgtt agggaggccaa aggagtgtat ctatgtatgaa ccggacagg 1200

245 aagggtgacaa gaaagggtgt tactggtaca acaataagtt atgagcatga tggtaagaa 1260

246 attgtcgacc ttgttgc ttcgttgc tttgtttaaa aagctatgt tcgttttaat 1320

247 aatcttatttgc tccattttgt tttgttatga cattttggct gtcattatgt tt 1372

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251 <400> SEQUENCE: 6

W--> 252 000

254 <210> SEQ ID NO: 7

255 <211> LENGTH: 33

256 <212> TYPE: PRT

257 <213> ORGANISM: Arabidopsis thaliana

259 <400> SEQUENCE: 7

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262 Pro Asp Arg Glu Gly Asp Lys Lys Gly Val Tyr Trp Tyr Asn Asn Lys

263 20 25 30

264 Leu

268 <210> SEQ ID NO: 8

269 <211> LENGTH: 30

270 <212> TYPE: PRT

271 <213> ORGANISM: Saccharomyces cerevisiae

VERIFICATION SUMMARY
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Input Set : A:\PTO.txt
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L:14 M:270 C: Current Application Number differs, Replaced Current Application No
L:14 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:252 M:300 W: (50) Intentionally skipped Sequence, : Sequence Id (6) SEQUENCE:

TOOEE50 - FEE E9/2/60